7/Response Declaration 6/3/03 DBE11

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Toru HANADA, et al.

Docket No: Q68451

Appln. No.: 10/066,594

Confirmation No.: 8377

Group Art Unit: 2871

Filed: February 06, 2002

Examiner: Tarifur Rashid Chowdhury

For: LIQUID CRYSTAL DISPLAY COMPONENT AND TRANSPARENT CONDUCTIVE SUBSTRATE SUITABLE FOR THE SAME

PRELIMINARY REMARKS

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This in response to the Office Action of February 25, 2003, a response to which is due May 27 (May 25 falling on a Sunday and May 26, 2003 being a Federal Holiday).

Claims 27 and 28 are all the claims pending in the application.

Claims 27 and 28 are rejected under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,183,829 ("Daecher").

In response, Applicants previously submitted an amendment emphasizing the difference between Daecher and the claimed invention.

In further support of patentability of the present invention, Applicants provide the attached Declaration of Mr. Toru Hanada.

Daecher does not disclose a substrate which has a total light transmittance of 80% or more and which is formed by a solvent casting method resulting in the polymer substrate of claim 27 which has having excellent surface smoothness and optical isotropy, as described at page 5, lines 11-13 of Applicants' specification. Daecher merely discloses a plastic sheet produced by a process comprising the step of providing molten plastic resin (column 2, lines 30-41). One of ordinary skill, upon reading Daecher would understand that the disclosed process necessarily uses molten resin (ex. column 10, lines 15, 36, and 37).

The attached Declaration of Toru Hanada shows that Applicants' claimed invention cannot be made from the disclosure of Daecher. Applicants conducted experiments comparing the claimed invention (Run 2) to the closest examples disclosed in Daecher. When a transparent polymer substrate composed of a polycarbonate copolymer (BisA/BCF-PC) of the present invention was formed by melting at high temperature of 340°C using the same as the method of Daecher, the resulting plastic sheet was fragile, brittle and displayed an undesireable hue (Run 1). As to Run 3, the film produced by the molten polycarbonate was fragile and did not form a film. Therefore, the film of the comparative examples were not suitable for use as a transparent polymer substrate for a liquid crystal component.

On the other hand, a transparent polymer substrate composed of the polycarbonate of Run 2 of the present invention had superior brittleness and hue. Therefore, the claimed polycarbonate is unexpectedly superior for use as a transparent polymer substrate suitable for a liquid crystal component. Moreover, the examples of Daecher do not lead to the claimed invention.

Therefore, the present invention is not disclosed or suggested from Daecher. For the reasons set forth above, it is respectfully requested that the rejection be reconsidered and withdrawn.

Respectfully submitted,

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Date: May 27, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of
TORU HANADA, et al.
Serial No.: Application of 10/066,594
Filed: February 6, 2002
For: LIQUID CRYSTAL DISPLAY COMPONENT AND TRANSPARENT CONDUCTIVE SUBSTRATE SUITABLE FOR THE SAME
Commissioner of Patents
Washington, D.C. 20231

DECLARATION

I, TORU HANADA, resides in 3-18-4 Tamadaira, Hino-shi, Tokyo-to, Japan, entered the Faculty of Materials Science and Engineering of Waseda University in April 1985 majoring in material science, took the master's course in electronics material science at the same University in March 1991, entered Teijin Limited in April 1991, was attached to the Polymer Material Research Laboratory of the Company, and engaged in research into improvement of the surface resistance of polycarbonate for 2 years, and has engaged transparent polymer films for a liquid crystal display.

I am one of the inventors of the present invention. I have conducted the following experiment to make clear that the present invention provides a marked effect different from that of US patent No. 6,183,829.

Experimental

A polycarbonate copolymer (BisA/BCF-PC) having the bisphenol component consisting of BisA/BCF=1/1(molar ratio) and having an average molecular weight of 37,000 and Tg of 225℃ was dissolved in methylene chloride in such a manner as to become 20% by weight. This solution was cast on a polyester film 175 μm thick by a die coating method. Subsequently, the coated film was dried in a drying furnace until the remaining solvent concentration became 13% by weight, and the polycarbonate film was peeled from the polyester film. The obtained polycarbonate film was dried in a drying furnace of 120℃ until the remaining solvent concentration in the film became 0.08% by weight under holding the balance between longitudinal and lateral tensions.

Thus-obtained transparent polymer substrate (S) has a thickness of 100 μm and a light transmittance of 91% at a wave-length of 550 nm. The polymer of Run 1 has a 15,500 Viscosity-average molecular weight and the polymers of Run 2 and 3 each has a

15,500 Viscosity-average molecular weight.

The polymer of Run 2 corresponds to that of the Example 4 of the present invention. A film formed by a solvent-casting method is robust and has a good hue (b value).

In Run 1, a film was produced by a melt extrusion molding method at 340℃. The obtained film was fragile, and had a thickness of 150 μ m and a yellow color (hue=3.058, measured by the spectro photometer U-4000 manufactured by HITACH, Ltd.).

In Run 3, a film (which is composed of a larger molecular weight than that of Run 1 and the same molecular weight as that of Run 2) was produced by a melt extrusion molding method at 340℃. However, the film was not obtained. We believe the polymer had too molecular weight.

As described above, the polycarbonate of Run 2 of the present invention was excellent as a transparent polymer substrate suitable for a liquid crystal component.

On the other hand, Comparative Runs 1 and 3 show that the film produced by the molten polycarbonate was fragile or did not obtain because of high molecular weight, so these films of Comparative Runs 1 and 3 were not suitable for use as a transparent polymer substrate suitable for a liquid crystal component.

Table I

	Run 1	Run 2	Run 3	
Copolymer of bisphenol unit	Example A	Example B (Example 4 in Description)	Example C	Measurement method
Bis-phenol A (Bis-A) Composition Ratio	50 mol%	50 mol%	50 mol%	NMR
Bis-cresol Fluorene (BCF) Composition Ratio	50 mol%	50 mol%	50 mol%	NMR
Viscosity-average molecular weight	15,500	37,000	37,000	GPC : Gel Permeation Chromatography
Way of forming	Melt extrusion molding*)	Solvent-casting	Melt extrusion molding*)	
Brittleness	Fragile	No problem	A film was not formed	bending at 5 mm ϕ
Hue (b value)	3.058	0.8	-	film thickness: 2 mm, light ray: C/2, transparent method

*) melting temperature: 340 ℃

The undersigned declarant further declares that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

The 14 th day of May, 2003

T. Idanada

Toru HANADA